

CLAIMS

What we claim is:

1. A purified and isolated nucleic acid molecule encoding a Tbp2 protein of a strain of *Moraxella* which strain is selected from the group consisting of *Moraxella catarrhalis* M35, 3 and LES1.
2. The purified and isolated nucleic acid molecule of claim 1, having a DNA sequence selected from the group consisting of:
  - (a) a DNA sequence as set out in Figure 2, 4 or 6 (SEQ ID NOS: 1, 3 or 5) or the complementary DNA sequence thereto; or
  - (b) a DNA sequence encoding an amino acid sequence as set out in Figure 2, 4 or 6 (SEQ ID NOS: 2, 4 or 6) or the complementary DNA sequence thereto.
3. A vector adapted for transformation of a host comprising the nucleic acid molecule of claim 1.
4. The vector of claim 3 further comprising expression means operatively coupled to the nucleic acid molecule for expression by the host of said Tbp2 protein of a *Moraxella catarrhalis* strain M35, 3 or LES1.
5. A transformed host containing an expression vector as claimed in claim 4.
6. A method of forming a substantially pure recombinant Tbp2 protein of a *Moraxella catarrhalis* strain M35, 3 or LES1 which comprises:
  - growing the transformed host of claim 5 to express Tbp2 protein as inclusion bodies,
  - purifying the inclusion bodies free from cellular material and soluble proteins,
  - solubilizing Tbp2 protein from the purified inclusion bodies, and

purifying the Tbp2 protein free from other solubilized materials.

7. A recombinant Tbp2 protein of *Moraxella catarrhalis* strain M35, 3 or LES1 producible by the transformed host of claim 5, having a deduced amino acid sequence selected from the group consisting of those shown in Figure 2, 4 or 6 (SEQ ID NO: 2, 4 or 6).

8. An immunogenic composition, comprising at least one active component selected from the group consisting of:

(A) a purified and isolated nucleic acid molecule as claimed in claim 1; or

(B) a recombinant Tbp2 protein as claimed in claim 7;

and a pharmaceutically acceptable carrier therefor, said at least one active component producing an immune response when administered to a host.

9. A method for generating an immune response in a host, comprising administering to the host an immunoeffective amount of the immunogenic composition of claim 8.

10. A method of determining the presence, in a sample, of nucleic acid encoding a transferrin receptor protein of a strain of *Moraxella*, comprising the steps of:

(a) contacting the sample with the nucleic acid molecule of claim 1 to produce duplexes comprising the nucleic acid molecule and any said nucleic acid molecule encoding the transferrin receptor protein of a strain of *Moraxella* present in the sample and specifically hybridizable therewith; and

(b) determining production of the duplexes.

11. A diagnostic kit for determining the presence, in a sample, of nucleic acid encoding a transferrin receptor protein of a strain of *Moraxella*, comprising:

(a) the nucleic acid molecule of claim 1;

(b) means for contacting the nucleic acid molecule with the sample to produce duplexes comprising the nucleic acid molecule and any said nucleic acid present in the sample and hybridizable with the nucleic acid molecule; and

(c) means for determining production of the duplexes.

12. A nucleic acid molecule of claim 1 when used as a medicine.

13. A recombinant transferrin receptor protein of claim 7 when used as a medicine.

14. The use of a nucleic acid molecule of claim 1 in the manufacture of a medicament for protection against infection by a strain of *Moraxella*.

15. The use of a recombinant transferrin receptor protein of claim 7 in the manufacture of a medicament for protection against infection by a strain of *Moraxella*.